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the lamentable departure of his brilliant colleague, the late Professor Penfield, mineralogical science has lost two of its foremost and ablest promoters.

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SCIENTIFIC JOURNALS AND ARTICLES

Journal of Economic Entomology, Vol. I., February, 1908–December, 1908; Vol. II., February, 1909–December, 1909.

It is not often that it is possible to write a review of a periodical with its numerous contributions of varying merit, and it is possible in this case only because it is a growth and illustrates the growth of a science and its development along practical lines. It is stated on the cover that this is the official organ of the Association of Economic Entomologists, and any note of the *Journal* must contain some record of this association.

It was at Toronto, in August, 1889, that the Association of Economic Entomologists was born at the call of the late Dr. James Fletcher, with the extremely limited membership of twenty-two, which elected the late Dr. C. V. Riley, then entomologist to the U. S. Department of Agriculture, as its first president, and the writer of this review as its secretary. During the twenty years following that initial gathering, the writer has been in attendance at most of the meetings, and has seen its membership increase until, under new restrictive laws, there are 119 active, 125 associate and 47 foreign members—a total of 291. More entomologists here, more or less engaged in active research work, than the wildest dreams of the founders considered possible at the initial meeting.

From the beginning, the relation of this association with the U. S. Department of Agriculture was close. Small as the entomological division of the department was at that time, compared with its present-day development, it represented to the rest of the country a source of authority and information which, in all subsequent development, has not lessened in value, even if not as dominant now as then.

Dr. Riley, as the first president of the association and one of its most active promoters, was naturally interested in securing publicity to its transactions, and reasoning rightly that any force that made for impressing upon the agricultural public the value of entomological work was worth using, he induced the then commissioner of agriculture to authorize the publication of the proceedings of the association in *Insect Life*, where the record of the organization takes up a part of pages 87 and 88 of Vol. II., and the records of the first annual meeting take up pages 177–184 of the same volume. During the continuance of *Insect Life*, an ever-increasing space was occupied by this association until, in 1893, at the fifth annual meeting, an entire number of *Insect Life*, of about 145 pages, was taken up by its records. After the discontinuance of this periodical, the records of the association were published in the bulletins of the department, and Dr. L. O. Howard, who succeeded Dr. Riley as head of the entomological division, followed the policy of his former chief in recommending the publication of the proceedings of the association by the department.

But, as the membership increased and as, to speak metaphorically, the association felt its oats, the tendency was to divorce the association, loosely constituted as it was and in no position to assume publication, from the department and to throw it upon its own resources. It solved the problem of support for the proposed journal by the organization of a publishing company which assumed financial responsibility, while the association furnished material to be published, as well as the subscribers.

The writer was one of the conservative members who, by age and long habit, was wedded to past methods, and who opposed the establishment of the *Journal of Economic Entomology*. It gives him pleasure to admit that he was all wrong; that the establishment of the *Journal* was justified by results, and that the cause of economic entomology was materially advanced by the action of the association in 1908.

The *Journal of Economic Entomology* under the editorship of Dr. E. Porter Felt, of Albany, N. Y., and under the business management of Professor E. D. Sanderson, of Durham, N. H., has been a power for the development of economic entomology. It has not only published the records of the meetings of Chicago in 1907, and at Baltimore in 1908, but it has secured for economic workers throughout the country, records of progress throughout the season, and it has made possible the early publication of results that were of sufficient importance to warrant the attention of other workers along similar lines. It would be easy to criticize adversely individual publications in this journal, and to find fault with details of management, but in that it would share only the fate of other periodicals that depend upon individuals for their contents. The *Journal of Economic Entomology* has not only justified itself during the nearly two years of its existence; but, in the opinion of one of its opponents, has done excellent work in the advancement of the science whose records it publishes.

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SPECIAL ARTICLES

ON THE PLANT GEOGRAPHY OF THE CHIRICAHUA MOUNTAINS

THE CHIRICAHUA MOUNTAINS¹ of southeastern Arizona extend almost due north and south for some 50 miles from Fort Bowie to a point near College Peak, and within 15 miles of the Mexican Boundary, with a maximum width at Paradise of 18 miles. On their west lies the broad and level Sulphur Springs Valley at about 5,000 feet altitude, on their east the trough-like San Simon Valley drops to nearly 3,500 feet. The highest part of the range extends from Paradise to Rucker Canyon, consists of five or six more or less elongated forest-covered peaks whose axes lie in a north-

east-southwest direction, and rises in Cave Peak to an altitude of about 9,700 feet above sea-level.

As one might expect, the tree growth is quite similar to that recently given by Mearns² for several mountain ranges near the international boundary of this region. Of the 54 species (including a few shrubs) mentioned as occurring about 12 or 15 mountain masses of his "Elevated Central Tract," 48 are found in the Chiricahuas alone. He enumerates 137 arborescent species along the boundary from Texas to the Pacific Coast. In the Chiricahuas were found, exclusive of succulents and Liliaceæ, a total of 124 species of trees and shrubs. These consist of 111 angiosperms and 13 gymnosperms, all the latter being trees except *Ephedra* sp., and all evergreen. Of the angiosperms, 35 are trees and 76 are shrubs, making a total for the mountains of 47 trees and 77 shrubs. Ten of the latter are suffrutescent composites, probably all more or less evergreen, at least when sufficient moisture is available. Of the remaining shrubby species, 39 are deciduous and 16 evergreen, while 12 in this respect are unknown to the writer. Thus the total of known evergreens is 47, that of deciduous species, 65. Other species will be found, but they will probably not materially alter these proportions.

This does not, however, give the key to a true, general picture of the floral geography. This must rather base upon the number, size and distribution of the individuals composing the more prevalent species. From this viewpoint, leaving out of consideration the winter-dead ground-cover of perennial and annual grasses and herbs, the evergreen character is altogether dominant. The Lower Sonoran zone, characterized by its cacti and thorny shrubs, often drouth-deciduous, touches the mountains only at their eastern base and both ends. The Upper Sonoran completely encircles them in a broad belt of evergreen brush land, with the oaks as leading species, corresponding to one of the types of Schimper's Immergrünes Hartlaubgehölze. This extends well into the Transition zone, and here mingles with the

¹ In 1906 and 1907, ten months were given to the exploration of this range, some 1,600 miles covered within its bounds, and about 1,050 species of plants collected. Undoubtedly many other higher plants may be found.

² "Mammals of the Mex. Bound. of the U. S.," Part I., Bull. 56, U. S. Nat. Mus., 1907.